

From W. H. Huddleston  
To R. H. Huddleston

For information

In reply to my letter  
to India of 15 Jan.  
it will be observed  
that there are apparently  
no reports forthcoming  
on our ~~desires~~ harbor  
by Colonel Thomas  
during that connected  
with the Madras harbor  
itself which it will  
be remembered was  
practically set aside  
by the decision of the  
Government to proceed  
with the works as  
designed by Mr  
Parker  
The ~~letter~~ <sup>order</sup> however  
does ~~order~~ <sup>order</sup> to ~~do~~

*W. H. H.*

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Andrew Clarke's  
Minute on Indian  
Harbours which the  
Members of Government  
will no doubt desire  
to peruse, though  
it may at once be  
said that most of  
the observations were  
based on imperfect  
reports - in fact made  
previous to the reports  
which may have been  
submitted personally to  
Sir Andrew by Col.  
Thomson after his  
inspection.

So far as concerns  
Andrews the remarks  
in the minute refer  
to the following  
ports only as capable  
of being made harbours

of refuge and of  
being made defensible  
viz: Pannam Beyre  
Vizagapatam, Madras,  
Pannam, Cochin,  
Beyre and Longa  
lore.

It would be out  
of place here to  
enter into any detailed  
statement regarding  
these several ports &  
the reasons in which  
it would now seem  
improbable that  
they are likely to  
be erected into first  
class harbours of the  
character contemplated  
but a brief allusion  
to the present state  
of the question in  
connection with each  
may not be unaccep-  
table to Government.

Vizagapatam was  
carefully inspected  
by the Master Attendant  
and myself last July  
and notwithstanding  
the many and various  
schemes put forward  
in creating a first  
class harbour here  
the difficulties were  
of such an insuperable  
character as to prohibit  
in our opinion any  
idea of the kind being  
seriously entertained

In this view the Board  
concurred and with  
the exception of certain  
minor improvements to  
facilitate boat traffic  
the schemes in connection  
with this port may be  
considered as finally  
shelved

Madras — As  
already observed it  
has been decided  
to carry out Mr Parker's  
scheme which though  
likely to prove very  
valuable to trade  
under the ordinary  
conditions of weather  
is not even by its pro-  
jector looked upon as  
a harbour of refuge in  
bad weather, this  
in a military sense  
it might be made so  
at other times

Panburem — This  
harbour I have failed  
to visit in any late  
travels, but hope to see  
it with the Master  
Attendant at a later  
period — So far  
as concerns the present  
narrow & rather

Coastwise passage  
west of the island  
of Ramisseram  
(which inventurers  
has done excellent  
service to the coasting  
trade & has thus  
amply justified the  
views of its projectors)  
there is no serious  
prospect to form  
in connection with this  
any harbour of the  
character contemplated  
by Sir Andrew Clarke

The work alluded  
to by the latter is a  
proposed cut some  
10 miles westward  
through the Ramuad  
Promontory connecting  
with a natural har-  
bour south, known  
generally as Sir James  
Spencer's Scheme -

C. 19. 2. 10. 20. 2.

It will perhaps  
surprise some to say  
that while even the  
Steamers the sailing  
by such a passage  
cannot be much over  
12 hours as compared  
with the passage round  
Ceylon owing to the  
impossibility of working  
through much of it other  
than in daylight there  
are difficulties of an  
enormous character to  
be overcome which to  
all appearances seem  
insoluble, unless with  
an expenditure of  
money which would  
be altogether disproportionate  
to the advantages likely  
to be secured

Cochin - I hope  
soon to be in a position  
to present with Capt.

2. Taylor a report on  
the probabilities of  
our creating a first  
class harbour at this  
port, it will therefore  
be needless to say  
more at present than  
that the prospects of  
success do not seem  
any assuming

Beypore - The  
Master Attendant  
and myself have come  
to the conclusion that  
there is no possibility  
of making a harbour  
of refuge out of this  
port - It seems to be  
undoubted that latite  
rock underlies the  
bar, which has only  
some 6 ft. of water in  
it at low tide, and  
the slope of the sea  
bed is so very gentle  
that even were this

Almost insuperable  
difficulty overcome  
the works would have  
to be carried out such  
a distance to Seairan  
as to necessitate an  
altogether disproportionate  
outlay

Mangalore - This  
is if anything a worse  
and more disappointing  
site for a first class  
harbour than even  
Beypore, although  
having a fine back-  
water and a bar of  
rather better character

The difficulty here  
is to fix the site of  
the mouth of the  
river which is con-  
trolled by the presence  
of latite rock as  
at Beypore has a  
tendency to move  
steadily northward

in a given cycle  
This movement in  
the last 54 years has  
been on an average  
300 yards per annum  
and it need hardly  
be said that looking  
to the various forces  
by which this movement  
is produced and  
again to the powerful  
character of the floods  
which come down the  
two rivers, which de-  
branch into the backwaters,  
it is quite hopeless  
to think of devising  
any practicable scheme  
by which a first  
class harbour shall  
be formed

The outlook so  
far as all these  
harbours are concerned  
is not to be best of

my judgment any  
cheering thought of  
course to construction  
of harbours of some  
such character as that  
contemplated by Sir  
Andrew Clarke at  
other places (especially  
where not interfered  
with by river action)  
may not be impossible  
If questions of trade  
were set aside in fact  
sites of this kind will  
even now be wanted  
on holding out fair  
prospects of success  
but it hardly seems  
probable at present  
that the Government would  
be prepared to enter  
uncompensated  
on large outlay in such  
work was consideration

From the ship owner's  
point of view & particularly  
that of Companies  
like the B.I.S.N.Co.

Picking up or dropping  
goods at every port  
harbours with their  
attendant difficulties,  
delays, and expense  
are so far as I can  
gather rather looked  
upon as nuisances &  
things to be avoided,  
and though no doubt  
the merchant on his  
side prefers to have the  
security he has in  
approached by wharfs &  
it would seem on the  
whole a very doubtful  
point as to whether in  
balancing the advantages  
against the disadvantages  
all round the latter  
will not be found to prevail  
excepting under circumstances  
which do not appear to  
exist in the Presidency

14.2.87

Att

#### MINUTE ON INDIAN HARBOURS.

NOTWITHSTANDING the many attempts which have from time to time been made to render the requirements of India commensurate with her rapidly increasing commerce, it is scarcely to be wondered at that these attempts have, as yet, produced comparatively small results. The harbour now in course of construction at Madras, on a site perhaps as little favored by nature for such a purpose as it is well possible to imagine, is one which, in its present aspect, could hardly be said to present encouraging features to any Government anxious to initiate a system of what may truly be said to be a class of engineering works novel to this country. Though my own experience of harbour engineering has been pretty extensive, I could not but feel, when addressing myself to His Excellency the Viceroy on the subject of my visit, in the early part of 1878, to the Madras Harbour Works, the great force which must of necessity attach to arguments advanced against further proposals for works of this nature, based, as such arguments might fairly be, on the results which presented themselves to me at Madras.

2. I owe it to His Excellency, however, that undeterred by the apparently discouraging aspect of affairs as they then stood, he did not at that time press me for a decision, which I felt that in justice to the designer of the harbour I could not venture to give without a more extended series of observations, and also that, acknowledging the immense importance of the subject of harbours to the general welfare of the country, he authorised me to institute some inquiries into the question as affecting other portions of the seaboard of India. The result of these inquiries forms the subject of this Minute, and will, I venture to hope, tend fully to justify the decision at which His Excellency then arrived.

3. The spectacle of our Indian seaboard of 2,000 miles between Bombay and Calcutta, unprovided with a single port where goods may be delivered direct from a ship's side on to a wharf, is one hardly consistent with our character as the first seafaring and mercantile nation in the world.

4. We have laid out millions on the public works of this country; but I think we may now fairly put to ourselves the question—is this neglect of our seaboard fair to the system of communications which we

have already established in the country? And on a justifiable assumption of more prosperous times returning at no distant date, may we not now prepare ourselves for such a future by some attempt to devise remedies for defects so obvious?

5. We need only look back on our experiences of last year to answer both these questions. Let us consider first the actual facts brought to light by the famine in Madras. The afflicted districts were depending chiefly on the line of railway connecting Madras with Bombay and on the imports by sea at Madras itself. The state of the railways converging on Bombay is well known to all. There was a block not only near Bombay, but extending up to Allahabad, Cawnpore, Agra and even farther north. No single line of railway could possibly have competed with such widespread demands. To this block the route *via* Calcutta could afford but partial relief; for its terminus was the port of Madras, already overtaxed for want of a harbour and direct communication with the rail on shore. The Hon'ble Mr. Mackenzie of the Madras Legislative Council, than whom perhaps we could not have a better authority, computed the pecuniary loss at the Madras port in grain alone from theft, damage and waste during the famine at no less a figure than 60 lakhs of rupees; whilst the monopoly enjoyed by the Madras boatmen was at that time taken advantage of by them to such an extent, as seriously to affect the cost of the grain being imported, and to act greatly to the prejudice of the trade of the port. Mr. Mackenzie estimated the cost of this lighterage at another 60 lakhs. With the famine came rumours of war; coast defences for the time became of paramount importance; and it is a fact that the heavy guns sent out in hot haste from England for the defence of Madras, after arriving off the town, had, owing to difficulties and risk of landing, actually to be carried all the way back to Bombay and thence conveyed to Madras by rail.

6. At Beypore during this crisis there was a railway terminus, but the railway for a great portion of the year was unfortunately practically useless, because the port is unapproachable from the sea for want of a harbour.

7. It seems almost incredible, but I am assured that in Vizagapatam, during the severest part of the Madras famine, wheat was selling in the Jeypore territory, within a few miles inland from Vizagapatam, at 100 seers for the rupee. But this magnificent food-producing district is

at present shut out from the seaboard for want of proper communications; and Vizagapatam, perhaps originally one of the finest natural ports on the coast of India, is not only unprovided with a harbour, but has, from unscientific treatment, been allowed to deteriorate to such an extent, that native craft actually built there only a few years ago cannot now enter the port and are resorting elsewhere.

8. Still confining myself to the general influence of lack of harbours on the internal traffic of the country, we need only go back to the last Orissa famine for an example of the results. This famine was chiefly local, but the produce of all our irrigated districts and the advantages of all our railway system in Bengal were alike thrown away—firstly from want of a harbour, and secondly from want of communication with the seaboard. The harbour of False Point, useful in its natural state for small craft, was unknown until nearly the end of the famine; and from False Point, even had it been known, there would have been available only an undeveloped system of inland water communication.

9. The history of past famines seems to prove two facts. First, that the railway system is lamentably deficient as to its communication with the shipping; and secondly, that the ports of India are too few for its wants. How these deficiencies may be overcome it seems now high time to consider; and in doing so, it becomes necessary not to separate these two questions from one another. Indeed famines have been following each other far too closely to permit us to postpone the consideration of such questions indefinitely. What the famines of recent years have actually cost the State we are not yet perhaps in a position to state; but be the sum 15 millions or 20 millions sterling, or anything approaching to these figures, it can scarcely be argued that the season is inopportune for considering an expenditure—which, compared with such amounts, must seem small—on harbours which, if they had been in existence, would have materially aided us in averting some of the worst features of these famines.

10. I have repeatedly stated my belief in the fact that at no time has there been a deficiency of food within the Indian Empire wherewith to feed the population. The Empire appears to be too large for such visitations to be universal: the rains do not fail throughout so vast a territory; and even in some parts where the rains do fail, our artificial irrigation works have gone far to supply the scanty rainfall.

The food is at the worst of times available within our borders; it only requires to be distributed; and in such case measures to facilitate distribution should, as remunerative public works, take precedence of all others. For distribution, nature has provided India with the ocean as the most economical route; and to avail ourselves of that it behoves us, first, to provide harbours, and secondly, railway communication leading from those harbours to the interior. The precedence of harbours even to railways seems justifiable; for they may be classed as works remunerative, as well as essential to the safety of our shores and maritime trade from external foes, not to mention the protection from the dangers of the sea that they afford to the many lives and valuable property engaged in that trade.

11. No mere doubling of railway lines will satisfy the requirements of the case, and even if it would, it seems very questionable if, in common fairness to the undeveloped portions of the country, the doubling of existing lines of communications should take precedence of new lines traversing fertile, but hitherto neglected, districts, and leading to ports apparently unaccountably overlooked in the projection of railway schemes up to this time—ports which nature has undeniably gifted with means of unbounded development into first class harbours, the influence of which on the future of the country it is as yet impossible to foresee.

12. Though no endeavour shall be wanting to prove the arguments in favor of the harbours now to be considered—and such proofs are not few—it is unfortunately impossible, in the existing state of the country's development, to reduce such proofs to actual figures; but it will not be out of place here to quote some facts pointing to the influence which a harbour and rail have exercised on the interior of a country in the case of Ceylon, and showing to what a very limited extent the trade of this country has in some instances as yet been developed.

13. A case has been quoted to me of some land in Ceylon, which only so recently as 1875 was purchased from Government at Rs. 33 per acre. The Colombo harbour is not yet completed, but its advantages have already been so far discounted, that this same land in the past year realised Rs. 138 per acre, though it was still in its original state; and it is also indisputable that no small portion of this enhancement is due to the liberal encouragement given to planters, and to the assistance afforded

by Government to enable them to connect their plantations with the railway. The population of Ceylon is under 100 per square mile, or (as a reference to Appendix II will show) less than one-half that of India per square mile, and the taxation of its population per head is twice as much as obtains in India. It is the existence of such facts as the above, that has enabled the Ceylon Government boldly to undertake at a cost of £400,000 such works as the Colombo harbour, as well as the railway from the harbour to the interior, a railway which, notwithstanding the stupendous engineering difficulties surmounted in its construction, is one of the best paying lines in this part of the world.

14. It is not likely that obstacles, greater than were met with in Ceylon, would be encountered in the development of any of those ports for India which will here be brought forward for consideration; whilst, on the other hand, it is important to bear in mind that with reference to soil, climate and population, this country enjoys many advantages over Ceylon. These advantages of India over Ceylon are well known to the planters; and measures which have financially proved so successful in the comparatively poor country of Ceylon could scarcely be considered of doubtful policy here.

15. It is instructive to trace the influence of increased facilities of intercourse on the land—the chief source of our revenue in India. Regarded from an agricultural point of view, the mere fact of being able to export more easily the produce of the country, is almost of minor importance to the advantage of being able to import manure, especially lime (which, as a rule, is the greatest need of the planters) at a cheap rate. We have heard much lately regarding the exhaustion of the soil, more especially in the highly irrigated districts of India. The existence of such deterioration in many places is beyond dispute, and no more efficient remedy for it can be devised than the establishment of good ports, and of easy communication between those ports and the interior of the country. The sea affords the most economical means of conveyance, and is moreover itself a prolific source of rich and valuable manure, as the traffic returns of the British India Steam Navigation Company amply testify. Until good ports, and railway communications therewith, are established in this country on a scale commensurate with its requirements, we cannot expect to realise more than an infinitesimally small portion of the revenue which the soil is capable of yielding, to combat successfully

with such gigantic calamities as the famines which have of late been unhappily so frequent, or to surmount the financial difficulties which so constantly beset us, notwithstanding the proverbial natural wealth of the country.

16. The rapid response of the country to increased facilities of communication cannot be better exemplified than by the history of the British India Steam Navigation Company. It is only some twenty years since that Company began to develop the coasting trade; and five years ago 800-ton steamers, plying once a fortnight, represented the extent of their operations. At the present time 2,000-ton vessels, running weekly, are insufficient for the trade which has been developed by this Company, and thus quintupled in five years. The fact is only quoted here to show how capable of expansion the coast trade of the country really is.

17. So rapid an increase admits of easy explanation. The British India Steam Navigation Company, from the fact of its possessing first class vessels, is in a position to grant bills of lading which are readily negotiable on the spot without entailing on the merchant the necessity of awaiting the arrival of his cargo at its destination before its value can be realised. This trade, though thus placed on a much better footing than formerly, is evidently as yet in its infancy; and the rate of its development cannot fail to be accelerated by any measures that may tend to the safety, accommodation and rapid delivery from, and on to, ships of the same class as those of the British India Company. From the facts quoted in the preceding paragraph, it may perhaps be argued that the British India Steam Navigation Company's trade has increased notwithstanding the absence of harbours, and that therefore harbours are not a necessity from a commercial point of view; but it must be borne in mind that the loss, due to cost of lighterage, damage and theft, incurred in the absence of harbours, falls on the country generally as represented by the producers and consumers, and not on the British India Steam Navigation Company, who would be liable to extra port-dues were harbours provided.

18. There is another view of the question, the importance of which must not be gauged by the brevity with which it will here be treated. Harbours of refuge are absolutely essential to the safety of the rapidly increasing commerce of this country. South of Karwar, on the Malabar Coast, the mud banks of Narakal and Alleppey are positively the only points for

which a vessel can make for safety in bad weather. For protection from a chance enemy's cruiser there is no port whatever along this coast for which our vessels could run; and the whole Coromandel Coast is equally badly provided. Such a state of affairs in a tract subject to violent cyclones cannot but bear its usual fruit in the terrible lists of casualties that annually recur. The subject of refuge harbours as regards the British Isles has engrossed the attention of one Parliamentary Committee after another; its imperial character has there been fully recognised, as also the absolute necessity of providing for such harbours, where necessary, partially or wholly from the Imperial revenue, according to the pecuniary circumstances of each individual port. It seems therefore unnecessary to urge its claims for consideration on a similar footing in this country. Even if Local Governments were capable of providing funds for works of this nature, it is not the trade or the safety of the shipping of one port, or of any one presidency, which is at stake; it is the trade of the Empire in general that is affected, and the question must be treated as an imperial one, if justice is to be done to it.

19. If then harbours are necessary for the commercial prosperity of the country, far more important does the question become if we consider its political aspect, in the face of such facts as the recent rapid development of some of the Navies of Europe, more especially those of Germany and Italy.

20. I need not here revert to the subject of Madras, which has already been fully considered elsewhere in my Minute on the Madras Harbour; but too much stress can hardly be laid on the fact that in case of a war with a foreign power, or in a war where we may probably find two or more European nations combined against us, one of the greatest dangers which can threaten us will be on our Indian seaboard. It is by this route alone that an enemy can hope to bring on to the scene of action with sufficient promptitude the vast stores of war material which, in our time, are absolutely essential to the conduct of a successful campaign.

21. As matters at present stand, we can really consider ourselves as possessing only comparatively few advantages over a maritime foe in the Indian seas. Not a single port do we own in India, the defences of which will stand any criticism. We know that Russia is ever active, in the matter of both coast defences and of increase to

her Navy in the North Pacific. The sympathy of Germany with Russia—active or passive—in many of the most important political events of the past few years is to my mind unquestionable. More than once we have had clear evidence of Italy following the lead of Germany in vital questions of European policy. Year by year we see an increase of Germans flocking eastward, and an increasing interest taken by Germany, hitherto apathetic on the subject, as regards the Suez Canal. The Press of Europe utters no uncertain sound as to the strong probability of a fusion, in the near future, of the kingdom of Holland with the German Empire—a fusion which is rendered all the more probable by the recent death of the Prince of Orange, and one which must result in the transfer to the German Empire of the whole of the important possessions constituting Netherlands India.

22. Nevertheless, with such facts patent to the whole world, not one single decisive step has yet been taken in these seas to place beyond question the safety of the seacoast of the country entrusted to us, or even to maintain that naval supremacy on which our very existence as a nation depends. Our possession here is at present undisturbed; and it is in our power, if we choose to avail ourselves of existing opportunities, to make our position impregnable to any maritime foe. In such a matter it will ill become us even to count the cost of coast defences; and knowing, as we do, that but few pregnable points on the Indian seaboard offer themselves to an enemy's attack, and that the cost of the harbours,—the most serious part of the outlay for defensive purposes at these points—would unfailingly be recouped to us in the course of years by the increasing commercial development of the country, it can hardly be argued that a shadow of excuse remains to us for the further postponement of works of such vital importance to the safety and welfare of the whole British Empire, more especially of those portions of it lying to the east of the Suez Canal.

23. There is an important contingency, the possibility of which should never be neglected, and that is a closure against us, even temporarily, of the Suez Canal. Supposing such an event to occur, and to find us at war with, say, Germany in possession of Netherlands India, and acting in alliance with Russia operating from a strong base at the mouth of the Amur; the result of such a state of affairs—which, it must be allowed, is not

at all an unjustifiable one to consider—must be that England could only communicate with India by the circuitous route round the Cape, and would thus be placed at an immense disadvantage as compared with her adversaries, who, if we may judge from the expenditure even now being incurred on the ports of Achcen, would not be slow to make the most of the important military positions so plentiful in Netherlands India. Even against such odds as this, we at the present moment have it in our power to protect ourselves, at a cost small as compared with that which would necessarily devolve on our adversaries. Such first class ports as those to be here considered, independent of their commercial advantages, would go far towards converting India itself into a new and most powerful base, far superior in every respect to that pertaining to any possible enemy in these seas.

24. The close connection of harbours with coast defences is of itself sufficient argument in favor of this view of the case. Let us rely as much as we will on our Navy, it must be evident that the establishment of a system of safe harbours on our coast, within reasonable distance of each other, would contribute greatly to facilitate warlike operations, defensive or offensive, whilst, by affording easily accessible refuge to traders in time of war, it would virtually remove all temptation from an enemy who might by any accident elude the vigilance of our cruisers. If we are to maintain our prestige as the first naval power in the world, the safety of our commerce in these seas in time of war must be above all suspicion; and the means are to hand, if we only create the harbours, for which the need is so evident. The facilities for coaling rapidly under the protection of friendly batteries, which harbours provided with efficient defences could alone insure, would tend more to place our naval supremacy in these seas beyond all dispute than any other measure we could adopt, as I think will be evident when I mention the fact, well known in the Navy, that, in these days of steam, no man-of-war steaming under pressure, chasing or chased, can safely keep at sea for a period extending beyond a very limited number of days.

25. In consequence of the proposals authorised by His Excellency the Viceroy, to which I have alluded at the commencement of this minute, Lieutenant-Colonel Thomason, R.E., has been deputed during the past official year to inspect the coasts of India, with a view to determine what ports might with advantage be taken in

hand, for the purpose of constructing harbours suitable to the requirements of the country; and, after an examination of the information collected and after personal consultation with him, I purpose bringing forward the following six ports for the favorable consideration of His Excellency the Viceroy—*viz.*, Karwar in the Bombay Presidency; Beypore, Paumben, Madras and Vizagapatam in the Madras Presidency; and False Point in the Bengal Presidency. North and west of Bombay the existing port of Karachi will suffice for the present; minor ports for small craft at Bhaunagar in the Gulf of Cambay and Mandavi in the Gulf of Cutch are already in course of construction at the expense of the Native States, in whose territories these ports lie. Colonel Thomason also draws attention to an excellent natural harbour at Shial Bet on the Kattiwar coast at the mouth of the Gulf of Cambay. The port is in Native territory, and improvements in lighting the entrances are now in hand, and will go far towards increasing its value as a harbour of refuge. It is premature as yet to consider Shial Bet from any other point of view than as being unquestionably the best natural harbour in the Gulf of Cambay and the nearest port to Delhi. Should the line for the further development of the rich province of Guzerat ever be extended so far from Wadwan, this is a port which some day may prove to be of great importance.

26. For Burma and the British territory on the east of the Bay of Bengal no works appear to be necessary; nature in that part of the world being bountiful in its provision of good natural harbours, perfect as harbours of refuge, and requiring only wharves and jetties to be added as the trade, population and internal communications increase to an extent justifying further expenditure. For this no provision would be necessary from Imperial funds.

27. Though not strictly harbour questions, there are two points to which a passing allusion will not be out of place here. The first is the defenceless state of Port Blair, which, owing to the natural features of the island, admits of easy remedy. Admiral Bythsea, too, who has made himself acquainted with that portion of these seas, points out forcibly the existence in them of numberless good natural harbours, any one of which, if occupied, might be turned to good account by an active enemy, and would be a source of serious embarrassment to us in time of war. The erection

of two or three strong batteries at Port Blair, which is a natural harbour, would add materially to our strength as regards the Straits Settlements and all that portion of the British possessions. The second point is the importance of a ship canal through the isthmus of Kra, at the southern extremity of the Tenasserim provinces. I myself believe such a project to be feasible; and there can be no question that, situated in our own territory as it virtually would be, such a canal would add immensely to our national strength. The subject is a large one, and might at a more convenient time be treated of separately. Between Bombay and Karwar there are numerous excellent minor ports, which will always be available as harbours of refuge; but their close proximity to the Western Ghâts—which to a very great extent shut them off from the interior of the country—forbids the entertainment of any project for their development as commercial harbours of an imperial character; and the same consideration also excludes them from the category of pregnable points in a military point of view, provided always that the ports of Bombay and Karwar receive that development as naval stations to which their natural features entitle them.

28. The six ports which I have selected as above, are well placed as regards their distances from each other; as harbours, they might be admirably adapted for purposes of refuge and commerce, and for the defence of the coast; and I am satisfied that these ends may be attained at a reasonable cost, and with every prospect of success from an engineering point of view. I am not yet in a position to state what the exact cost of these works would be. Proposals for obtaining fairly approximate estimates could however be submitted to Government; but I do not propose at present to make any attempt at exact estimates, for reasons which it is necessary that I should here specify. Of all engineering projects, hydraulic works—and especially harbour works—require above all things, continuous observations of the localities under circumstances varying as much as possible. Without such observations, nothing is more probable than the commission of errors, which subsequently it may become extremely difficult to rectify. As a case in point, I think I may fairly quote that of the Madras harbour, which could scarcely have been accepted as at present designed, had more extensive observations regarding the shifting character of the beach preceded the commence-

ment of the works. For the current official year, therefore, I think that Colonel Thomason cannot be better occupied than in simply continuing the course of observations, which he has already commenced. I consider it premature as yet to make any definite proposals for a permanent establishment to be employed on this work; and I would rather ask His Excellency's sanction to a continuance of his employment temporarily, as at present, with a small grant for contingencies. This will enable him to obtain such data as he may require, more economically through local sources, will leave him less trammelled in his movements, and will thus expedite the submission of preliminary projects to be dealt with more in detail hereafter by a permanent establishment, when circumstances shall be more favorable for such proposals.

29. Considering the lasting benefit that these works will confer on the country, a special loan to meet their first cost seems strictly justifiable, for they can scarcely fail (ultimately at least) to be remunerative. It is the nature of harbour works to progress slowly; and as those here proposed would probably occupy from fifteen to twenty years in construction, the consequent strain on our resources would be comparatively slight.

30. I have already made proposals for the Madras harbour on a different principle; but for those harbours here to be considered, I would propose that the expenditure on each should be limited strictly to the construction of such works (wharves and jetties) as are necessary to render the harbour self-supporting, when port trusts should be constituted. Under the management of such trusts, the money advanced from the Imperial Exchequer should be repaid, principal and interest, at 4½ per cent. by half-yearly instalments extending over a period of thirty years, all extensions and improvements rendered necessary by the extension of trade, being carried out from port funds.

31. Railways connecting each port with the railway system in the interior of the country will be necessary adjuncts to each port, and the exploration and surveying of the best lines should proceed *pari passu* with operations in connection with the harbours. The survey, and taking observations for both harbours and railways, will for some time afford valuable employment for establishment available in the Public Works Department. It is the most economical use to which, in view of the impracticability of immediately carrying out

reductions of existing establishment on the scale recently proposed, the present surplus establishment can be put, and therefore this preliminary work might with advantage be put in hand. A map accompanies this Minute, showing the connection of proposed harbours with the scheme for a system of trunk lines of railway, which formed the subject of my Minute dated 10th February 1879.

32. Proceeding, next, to consider the grounds on which these particular harbours are advocated, if we take them in due order from Bombay to Calcutta, we find first—

**Karwar**, in the Bombay Presidency.—Apart from recent negotiations with Portugal, a railway from this port to Hubli had already received the sanction of Government, and only awaited funds to enable work to be started. The line must eventually be prolonged to Bellary; and a mere glance at the map will suffice to show how invaluable such a line, if supplemented with a harbour, would have been during the late famine. It would hardly be too much to assert that had such existed, and had the railway communication with Karachi been completed, there need have been little anxiety on the score of a sufficiency of food at Bellary, where perhaps the distress was most severely felt. As it exists, Karwar is, to some extent, a fair natural port. A breakwater is, however, necessary to protect ships lying here in the south-west monsoon, when, though there is always safety, there may often be difficulty, in communicating with the shore. Fortunately, for the construction of such a breakwater, there is an unlimited supply of good granite between Karwar head and the Beitkul Cove; and this granite might easily be so quarried as, in a great measure, to furnish an excellent wharf, alongside which the largest ships might with safety lie. The work, moreover, is so situated as to afford good scope for the employment of convict labor; and I am convinced that this is a kind of work specially suited for such agency. In designing this harbour, some consideration will have to be given to the influence of the Sedashagar river, which, though but a few years ago discharging into the sea clear of the harbour, has now burst through its left bank into the bay. This port is, I understand, about to be resurveyed by the Marine Survey Department during the next season. The harbour, when completed, will be almost a perfect one, with ample accommodation to meet any trade, however ex-

tensive. There will be a constant, though gentle, current through it—a matter of vital importance from a sanitary point of view; and, having two entrances, it will be easily and safely approached in all states of the weather. Added to all these advantages, it may, at comparatively small cost, be rendered almost impregnable.

33. An alternative scheme to the above will also require consideration. To the south of Karwar Bay lies the Beikul Cove. This cove comprises an area of about 20 acres, which, if dredged out and provided with wharf-walls and an avant-porte, might probably meet all requirements for some time. The existing wharf-wall is only suited to very small craft, and resting, as it does, on insecure foundations—which prohibits the use of dredgers for removing the soft mud in the bed of the cove, and thus deepening it for the use of larger vessels—would have to be entirely removed, and a more substantial structure adopted. This scheme might be practicable; but its comparative cost will require to be estimated and scrutinised, as well as the influence of the Sedashagar river, now discharging into the Karwar Bay, on the entrance of such a port which would virtually be a dock, pure and simple.

34. *Beypore* is already a place of some importance from its position at the terminus of the Madras Railway. It must before long become still more so when new railways connect it with the Wynaad and directly with Bangalore. The country in the vicinity is a most promising one; and much that is now waste and useless must, with the advent of rail and harbour, become extremely valuable, as surely as a similar result has ensued from the Colombo harbour and its railway in Ceylon, as already noticed. The recent information too regarding the gold in these regions adds still further to the importance of Beypore as a harbour. The immediate influence of a good harbour here on the traffic returns of the Madras Railway we cannot at present estimate with any degree of certainty, but it would probably be very considerable. Further inspection of the port proves a good harbour to be perfectly feasible at a reasonable cost. The most favorable features are a backwater, which, with the help of some artificial works to concentrate its effect, may be made to supply any necessary amount of scour to maintain a clear entrance within groynes, for the correct position of which nature markedly shows the true alignment. Some rock may, or may not, exist under the present bar. Further

investigation and surveys about to be undertaken will shortly settle this point. But should they be found to exist, they will probably admit of removal; and the mud, now found at the point where the harbour mouth will be hereafter, gives every promise of a comparatively quiet and easy entrance when once the harbour works shall have been completed. The interior capacity will be ample for all requirements. As bearing on the question of the importance of a harbour at Beypore, I would here draw attention to Appendix I, where will be found communications on this subject addressed to Colonel Thomason by the Collector and chief merchants of Calicut, Beypore and the neighbourhood.

35. *Paumben* entails the construction of a ship canal through the Ramisseram Island. This canal has been often projected, and the project which I now have in view only differs from its predecessors in a slight alteration in the direction of the canal, so as to insure greater protection for its northern entrance; in the utilisation of the rock obtained in excavating the canal to make a breakwater for the protection of the southern entrance; and in the formation of a first class harbour south of the southern entrance by connecting the above breakwater at its western extremity with the Ramisseram Island, thereby isolating the harbour from the present Paumben Channel, which will thus be made a vehicle for carrying clear of the canal and harbour the sand and silt now travelling along the coast of the mainland. Now that the Ceylon Government have undertaken the construction of a harbour at Colombo, the construction of the ship canal at Paumben is, to them, a matter of minor importance; but for this country it will be invaluable, as an easy outlet to the richly irrigated district at the southern extremity of India. The completion of this work, and some necessary light-houses north and south of it, will materially shorten the distance for all vessels passing from one coast of India to the other. The tolls may be levied with ease, and, if light, cannot fail to be very remunerative. Finally, as a naval station for purposes both of offence and defence, the advantages offered by the canal and harbour combined cannot be overestimated. A tramway is already contemplated by the Government of Madras for the purpose of connecting Paumben with the railway system at Madura; and the conversion of this tramway into a railway will be an easy matter.

36. *Madras* has its harbour already under construction, and has received its

share of notice elsewhere. It will suffice here to say that it is hardly likely to accomplish all that it should do for a sum less than 1½ millions sterling in excess of the original estimate.

37. *Vizagapatam* is, perhaps, the most important of all the harbours here proposed. It is really a natural site for a harbour, and appears to be the only one along the whole of this dangerous Coromandel Coast. Naturally, it had a magnificent backwater, a proper utilisation of which would have sufficed to convert the natural harbour into a first class one for ships of the largest tonnage; but, unfortunately, land-reclamation has been allowed to take precedence of harbour works, and (as must invariably happen under such circumstances, unless extra care be taken) the harbour has suffered, and the present available depth is considerably less than it once was. This, however, admits of remedy; and the abundance of good granite available actually at the proposed harbour mouth, and the favorable nature of the submarine contours at this point, coupled with the advantage of the extensive backwater, forbid the sacrifice of such a harbour site for land-reclamation purposes. The work will, in the first instance, consist to a great extent of quarrying operations, which will afford ample scope for the employment of convict labor at a place where, Dr. Smith, the Superintendent of the Vizagapatam Jail, informed Colonel Thomason that such employment is much required. Vizagapatam is near the centre of the largest area in India unprovided with a railway; the roads leading from it all fall short of, and have as yet failed to tap, the rich country lying beyond the Ghâts in its vicinity. It is the nearest point of seaboard to Jabalpur; and there can be no question as to the necessity of at least connecting it by rail with the lately sanctioned line from Nagpur to Raipur. What route this line will eventually take across the Central Provinces before it joins the North-Western Provinces system from Cawnpore to Saugor it is as yet premature to say; but considering the wealth, both in grain and minerals, including coal, yielded by the region which such a line would traverse, Vizagapatam promises, in the future, to be second to few ports in India. It admits too of easy defence. Under these circumstances the preparation of projects for the harbour, and the lines of railway leading therefrom, might perhaps be undertaken at no distant date.

38. *False Point*, in the first instance, will be valuable chiefly as a harbour of

refuge, where one is sadly needed. Established as such, with the canal communication completed to Cuttack, as it shortly will be, it will be valuable as the port for Orissa; and with such a port, and such connection with Cuttack, a second Orissa famine may almost be considered impossible. A good port here would enormously enhance the value of the Orissa canals; and it is more than probable that a still greater future awaits False Point as an outlet for a railway from Benares. Too little is known of the intervening country to speak with certainty on this point; but the necessary inquiries should be set on foot. The country to be served, though poor in parts, is rich in others, especially as regards mineral wealth. Benares is a good objective point, as the one where the Oudh and Rohilkhand Railway meets the East Indian Railway; and, as a port of arrival and departure, False Point promises many advantages to much traffic, which might by this route avoid the expenses and dangers of the Hooghly navigation. At present it is anything but a stable harbour, since year by year it is deprived by the mud of the Mahanadi of what backwater is gained from the sea. The waters of the river however can easily be excluded; and for the construction of the groynes, necessary to form a harbour on the system of fascine work in vogue in Holland, there is an unlimited supply of jungle brushwood available.

39. There are two ports which have not here been brought forward, but which need not on that account be excluded from future consideration—*viz.*, those of Mangalore and Cochin.

40. *Mangalore* undoubtedly admits of being converted into a useful harbour; but it is a shifting one at present, and, when undertaken, will admit of no delay in its completion, if it is to be a success. In these circumstances the project may lie over until the prospects of a railway, connecting it with the interior, are better than at present.

41. *Cochin* is one of the most promising sites for a harbour on the west coast; but it cannot be regarded as a charge entirely on Imperial revenues under existing circumstances. Practically, it exists in independent Native territory; and as such it seems only reasonable that at least a moiety of the cost should be defrayed from the treasuries of the States concerned. With them should rest the initiation of any project for a harbour; and when the proposals come before the Supreme Government, they will undoubtedly receive the attention they may deserve, and be judged on

their own merits. The exclusion of Cochin from the list of harbours now proposed must not in any way be held as depreciating its claims to consideration. In the meantime, I am glad of an opportunity of bringing to notice the claims of the Cochin merchants, as embodied in a letter addressed by them to Colonel Thomason. This letter, together with a demi-official one from Mr. Oughterson (of the firm of Messrs. Pierce, Leslie & Co.), containing useful statistics, will be found in Appendix II.

42. It must not be supposed that the six harbours here advocated are by any means the only ones that are practicable on the coast of India. The science of harbour engineering, more especially at the mouths of deltaic rivers, is at the present time receiving much attention at the hands of American engineers; and recent experience bids fair to upset many preconceived ideas which have hitherto been accepted almost as axioms. It is quite possible that the mouths of the Godavary, the Kistna and the North Pennair, the cost of the conversion of which into good harbours has hitherto been prohibitive, may, before long, prove quite feasible under different treatment to that which has hitherto been in vogue; but, even should such prove to be the case, the fact need in no way militate against the harbours here proposed. It is not the smallest recommendation to the proposed projects that, with the exception of Madras, to which we already stand committed, in none of them is any new or doubtful engineering point involved, and that for each one, successful precedent can be quoted. These harbours are well situated as regards the requirements of the country, whilst their position gives us a basis for a sound railway system, dealing impartially with every portion of the Empire. With these harbours and their corresponding railways, the recurrence of disastrous famines on the scale we have lately witnessed may be considered almost impossible. The addition of defences to the harbours would render our position practically invulnerable to any maritime foe; whilst of the influence of such public works on the public revenue, due to increased trade, reclamation of land at present waste, the more equal distribution of existing population, and the introduction of capital, it is impossible to form even an approximate estimate.

43. The imperial character of the question involved in the scheme of harbours, and railways in connection therewith, will

at once be evident from a glance at the accompanying skeleton map. Too much stress can hardly be laid on this fact in connection with the Crown's occupancy rights over the foreshore; for incalculable mischief may result from the opposite view, as an illustration of which I may quote the case of the foreshore at Bombay, which has lately been the cause of such complications. At Vizagapatam, again, the devotion of a most valuable portion of the backwater to a land-reclamation scheme has already been shown to have exercised a most deleterious effect on the harbour, and must entail on Government a heavy charge for compensation, which will most certainly increase with advancing years, and cannot therefore be dealt with too soon. It is impossible as yet to say what may, or may not, be harbours of imperial importance in the future. The construction of a harbour on too small a scale at first, or the entertainment of inviting land-reclamation projects, both of which contingencies are only too probable when the decision remains with local authorities, are measures far too costly in their results not to enjoin the strictest caution in dealing with them. I would therefore strongly urge the importance of measures being at once taken to insure that all harbour projects or interference with foreshore, even on the smallest scale, and though at the expense of local funds, be in future first submitted to the Supreme Government for sanction.

44. The interests involved in this harbour question are universal; and it is perhaps to the fact of "every man's business being no man's business," that the little interest hitherto excited in it can alone be attributed. The sailor we know to be proverbially careless where danger is concerned, whilst the shipowner insures his ship, and recovers cost from the shipper. To the shipping agent it matters little what may be the cost of going to and from the ships. These are simply items in his bill; and even the tradesman can, in a great measure, recoup himself for losses incurred on this account. All of these are more or less corporate bodies, and by means of their chambers of commerce or trades associations, can make themselves heard when necessary. They, however, form but a small portion of the whole community who are more or less interested. It is the large body of producers and consumers which really suffers. Manchester may object to our import duties; but the present state of affairs imposes on importers and exporters indiscriminately a tax com-

pared with which all our customs dues are simply insignificant; and if the period of His Excellency's viceroyalty should be characterised by the initiation of that comprehensive scheme of harbours which has hitherto been felt to be so great a want in the development of trade, I think I may venture to affirm that it will readily be conceded, by even the staunchest free trader, that more than an equivalent will have been found for the unavoidable evil of the retention of those customs dues which, owing to the fact of the resources of the country consisting chiefly in her raw products rather than in her manufactures, are an important source of revenue to the Empire.

ANDREW CLARKE.

1st July 1879.

## APPENDIX I.

### CORRESPONDENCE WITH REFERENCE TO BEYPORE AS A HARBOUR.

No. 1958, dated 3rd December 1878.

From—W. LOGAN, Esq., Collector of Malabar,

To—LIEUT.-COLONEL THOMASON, R.E., on Special Duty, Bombay.

I HAVE received from Messrs. Hinde and Company copy of a letter, dated 23rd ultimo, signed by the chief firms at Calicut and Beypore and addressed to you, regarding the proposed harbour for this portion of the Western Coast. The Agent for Messrs. Parry and Company was, I understand, absent at the time.

2. From what I learnt in private conversation with you, I understand that the choice of a situation for such a harbour practically lies between Beypore and Cochin, both of which are ports belonging to my district.

3. To enable you to come to a decision in the selection of one or the other of these places, I have the honor to submit for your consideration the following facts and suggestions which seem to have a bearing on the point to be decided.

4. Beypore and the country through which the Madras south-west line of railway passes to its present terminus at Beypore are wholly British.

5. Cochin, on the other hand, is a very small bit of British territory, with extent, houses, and population as per margin, embedded, as it were, in the country belonging to the Native States of Cochin and Travancore.

|            |     |              |
|------------|-----|--------------|
| Extent     | ... | 1,085 acres. |
| Houses     | ... | 3,081        |
| Population | ... | 15,000       |

6. Both of those States are shut off from the eastern districts of the Presidency by a ridge of mountains which will always throw immense obstacles in the way of traffic passing from Cochin to the more arid regions to the eastward and south-eastward.

7. Beypore, on the other hand, lies nearer than Cochin to the remarkable break in the chain of mountains known as the Palghat gap, through which traffic has, from time immemorial, passed between the eastern and western portions of this Presidency. Under such circumstances, and other things being equal, trade would certainly concentrate at Beypore rather than at Cochin. Experience during the recent famine fully bore this out; for, even with its present superior advantages as a port *at which goods can be landed and shipped during the monsoon months*, grain from Cochin was not despatched in any quantity to the famine districts until the stocks of grain at Calicut, from not being replenished, owing to the closing of the port for the south-west monsoon, had run so low, that prices had to be raised. When prices rose, the grain from Cochin came in, and the supply of it fell off again when the Calicut port reopened for traffic after the south-west monsoon. The Calicut grain had to be transported by road and water, including the breaking of bulk twice before it reached the railway. The Cochin grain had continuous water carriage from the port of landing (Narakal mud bank) to the railway at Tiroor; and yet it was only while the Calicut and Beypore ports were closed for the monsoon that the grain from Narakal could compete successfully with that from Calicut.

8. Another point, and one of *the very greatest importance*, is that, even if a good harbour were made at Cochin, the security against famine of the western portion of Mysore and of the coffee districts of Coorg, Wynaad, and the Nilgiris would still be imperfectly provided for. I am unable to speak from personal knowledge of what was done in Coorg and the Nilgiris; but I can vouch for the fact that Wynaad (north and south) was one huge famine relief-work for the people of Mysore. The coffee-planters who could afford it had laid in stocks of grain before the monsoon came on; but most of them had to depend on the supply of grain in the local markets. Unremitting attention was bestowed on the Ghât roads, thereby enabling carts to take up supplies even in the very height of the south-west monsoon. Prices ran very high at times; causing great anxiety, and, even with the high wages obtainable on coffee estates (annas 4 per man and annas 2-3 per woman), the physique of the labourers degenerated terribly; but there was no appalling mortality, such as occurred in Mysore, only a few miles to the eastward. It is not too much to say, however, that, to ensure the future *safety* of this part of the country from famine, two things are, above all, necessary,—

(a) a harbour that can be used at all seasons of the year;

(b) a railway up the Ghâts, to connect it directly with the Mysore system of railways.

The harbour should clearly be at Beypore—not at Cochin. A glance at the map will, I feel sure, convince you of the correctness of this view. As regards the railway, the merchants have, I see, laid their views before you. In those views I most fully concur. I cannot understand how such an idea as that the people of this part of the country took no interest in railway extension could have occurred to the Government of India. It is said that the conclusion was drawn from their silence; but this was opposed to fact. The extension (only as far

( ii )

as Calicut) had been asked for, and had been sanctioned for execution; and because it seems the Government of India were not pestered by further applications, they at the last moment let the project fall through. The financial embarrassment of the Government on account of the famine has since kept the people from making their wants known; but I think you will be convinced from what I have said above that they have been none the less *fed*, and by none more so than by the unfortunate people of Mysore. It seems to me perfectly clear that their safety in the future will depend largely on the concentration of trade at a central point like Calicut-Beyypore, and that a harbour at Cochin, with a railway thence to Shoranoor, would be ineffectual in securing this important object.

9. As regards the natural facilities for making a harbour, you are of course the best judge. Cochin, clearly, has the advantage at present; and it is a point to be noted in considering what is to be done there that, even at present, no difficulty is experienced in carrying on shipping operations *all the year round*; for as soon as the difficulties of getting boats across the bar are experienced, the ships weigh anchor and go up to Narakal mud bank, where shipping operations continue uninterruptedly all through the south-west monsoon season. What Cochin requires more even than an expensive harbour are—

- (I) a line of railway connecting it with the Madras railway system; and
- (II) a good canal up the coast as far as Tiroor.

10. To sum up: I am decidedly in favor of concentrating trade at Calicut-Beyypore; for they are twin-ports, and what is for the advantage of the one is for the advantage of the other. The making of Cochin the principal port of this part of the coast would involve the settlement of political questions which would certainly be found difficult of adjustment. It would also be less effectual in securing the main object kept in view by the Government of India of preventing or mitigating the effects of famine. At the same time, I would strongly advocate the improvement of the Cochin harbour by the construction (on the guarantee of the Cochin Government) of a line of railway from Shoranoor to Ernacollum, and by the carrying out of improvements to the coast canal north of Cochin (each Government undertaking the portion lying within its own limits). These projects should, however, be subordinated to the main idea of concentrating trade at Calicut-Beyypore.

11. The statistical figures relating to trade will be forwarded to you very shortly.

No. 105, dated 25th January 1879.

From—W. LOGAN, Esq., Collector of Malabar,

To—LIEUT.-COLONEL THOMASON, R.E., on Special Duty, Bombay.

With reference to the last paragraph of my letter dated 3rd ultimo, No. 1959, I have the honor to forward herewith copy of a statement showing the passengers and goods traffic, outwards and inwards, of the Beyypore station for the five years ending with June 1878. The customs returns will be sent shortly.

### MADRAS RAILWAY.

Statement showing the Passengers and Goods Traffic, Outwards and Inwards, of the Beyypore Station for the five years ending June 1878.

| PERIOD.                        | OUTWARDS.  |                      |          |                      | INWARDS.   |                      |          |                      |
|--------------------------------|------------|----------------------|----------|----------------------|------------|----------------------|----------|----------------------|
|                                | Passenger. |                      | Goods.   |                      | Passenger. |                      | Goods.   |                      |
|                                | No.        | Amount.<br>Rs. A. P. | Tons.    | Amount.<br>Rs. A. P. | No.        | Amount.<br>Rs. A. P. | Tons.    | Amount.<br>Rs. A. P. |
| Half-year ending December 1873 | 46,600     | 34,210 14 6          | 5,215½   | 47,222 3 2           | 45,341     | 36,006 8 6           | 23,081½  | 2,29,847 - 2 0       |
| Ditto June 1874                | 50,192     | 40,459 2 4           | 4,035    | 35,395 8 8           | 49,804     | 37,072 13 0          | 13,477   | 1,20,904 10 11       |
| Ditto December 1874            | 47,197     | 40,333 1 0           | 5,205½   | 42,246 2 0           | 48,294     | 38,921 8 5           | 22,595   | 2,28,079 10 6        |
| Ditto June 1875                | 52,433½    | 40,269 14 4          | 4,212½   | 39,075 12 0          | 52,949½    | 36,011 15 8          | 27,061½  | 2,84,915 5 0         |
| Ditto December 1875            | 42,487     | 31,967 3 0           | 3,195    | 33,155 2 0           | 39,624     | 30,201 14 0          | 19,147½  | 1,80,101 9 4         |
| Ditto June 1876                | 47,975     | 38,742 15 0          | 3,416½   | 35,647 13 0          | 46,805½    | 36,070 12 6          | 10,182½  | 86,351 7 0           |
| Ditto December 1876            | 41,722½    | 35,498 6 4           | 12,982½  | 1,12,222 11 0        | 40,705½    | 35,268 2 11          | 10,000   | 75,531 3 4           |
| Ditto June 1877                | 48,925     | 45,817 12 0          | 60,749½  | 4,70,993 9 0         | 47,100     | 41,617 7 5           | 8,280½   | 77,073 13 4          |
| Ditto December 1877            | 46,007     | 41,315 12 6          | 30,300   | 2,12,243 0 0         | 43,788½    | 38,636 0 2           | 4,468    | 89,309 12 8          |
| Ditto June 1878                | 48,060     | 42,701 4 0           | 15,522   | 1,10,569 14 8        | 47,149½    | 40,466 6 8           | 6,581    | 56,053 1 0           |
| TOTAL                          | 471,841    | 3,91,331 5 0         | 144,833½ | 11,45,371 11 6       | 491,561½   | 3,70,273 8 10        | 143,934½ | 13,78,257 11 1       |

J. CRAMP,  
Acting Chief Auditor.

Dated 23rd November 1876.

From—MESSRS. HINDE & Co. and other Merchants of Calicut and Beypore,  
To—LIEUT.-COLONEL C. S. THOMASON, R. E., on Special Duty, Bombay.

We much regret that during your recent official visit to this port we had not the opportunity of a personal conference with you on the subject of a harbour, which, we are informed, it is the intention of Government to construct at the most suitable position on this coast.

We need scarcely point out to you the deep interest we feel in such a work, and even more so in its necessary adjuncts—good means of internal communication, both by water and rail.

We propose very briefly to give you our general views on these points.

1. For nine months in the year the shipping trade on this coast can be carried on without much difficulty or danger to vessels: during the remaining or monsoon months, the only port at which vessels can call with safety is Narakal.

We are therefore of opinion that the construction of a harbour, which ships and steamers of large tonnage could enter at all seasons of the year, while not an absolute necessity in ordinary times, would, during periods of famine, prove of immense value to the country, provided proper internal means of communication are provided.

2. With reference to the most suitable site for such a harbour, the chief point which we as merchants have to consider is, what port would be the most central, and the best with a view to concentrate the trade of this and the adjoining provinces as much as possible, and to distribute the imports over the country generally? We reply that Beypore possesses the above requirements in a marked degree above any other coast port. It is, we may say, the central port of the province of Malabar; is the western terminal station of the Madras system of railways, thus connecting it with a considerable portion of the southern and central collectorates of the Presidency; while it lies at the mouth of a large river, and can at a very moderate outlay be connected with every port from Cochin to Cannanore by an extension of the existing system of backwaters and canals.

The question of the comparative cost of constructing a harbour at Beypore, or at any other point of this coast, is purely a professional point on which we offer no opinion.

3. We, in common with the entire native population of Malabar, have long looked forward with great interest to the time when Government would order the extension of the railway to the north from Beypore. You may possibly be aware that an extension as far as this town was among the sanctioned works a few years since, when to our extreme surprise and disappointment His Excellency the Governor General ordered that this the commencement of what we hoped would eventually be a large work of extension should not be entered upon, on the grounds that the "inhabitants of the province, from their silence, evidently did not take any interest in or care for the extension of the railway."

Never was a greater mistake made; and the inhabitants have since then maintained a silence on this matter, considering that the time was inopportune for urging their views upon Government; but they are now prepared to address the Supreme Government on the subject of railway and water communications in the province.

4. Whether a harbour is constructed at Beypore or at any other point in the coast, or even should the question of a harbour be for the present deferred, we would most respectfully, but strongly, urge upon Government the early commencement of the following works:—

- (1) A light line of railway from Beypore through North Malabar entering the Wynaad plateau at one of the low passes to the north of the Tambracherry Ghât, and thence on through Wynaad to join the Bangalore and Mysore Railway.
- (2) The opening up thoroughly of the present imperfect system of water carriage from Cochin and Narakal to Tiroor and Beypore.

The line of railway indicated above would, in times of famine, be invaluable for throwing supplies into Wynaad and Mysore, and in ordinary times would develop a large traffic in the following goods:—

Up—

Salt.  
Rice.  
Manures.  
Imported European Goods.

Down—

Coffee.  
Grains produced in Mysore.  
Teak, blackwood, and other valuable timbers.

The line would open up the coffee and gold producing district of Wynaad and the Nilgiris; it would immensely increase the value of the Government teak plantations, and

would (along the base of the Western Ghâts) have an almost inexhaustible fuel reserve to work upon.

With a well-developed system of water-carriage from Cochin and Narakal to Tiroor and Beypore, grain could, pending the construction of a harbour, be at all seasons of the year landed, and, in case of necessity, thrown into the central and southern collectorates, or into all parts of the Mysore country. The whole trade of this coast would be concentrated with immense advantage to Government and all concerned, and would receive such a stimulus as railways, cheap water carriage, and safe harbours alone can give.

Begging you will lay these our brief and hastily-written views before Government.

We have the honor to be,

SIR,

Your obedient Servants,

(Sd.) HINDE & Co.

" MASSEY & Co.

" G. MADDEN.

Agent, Bank of Madras.

" SCHLUNK, BROTHERS & Co.

" PEIRCE, LESLIE & Co.

" D. MANECKJI & Co.

" CHAS. COOPER ABBS.

" J. U. OUCHTERLONY.

" FOR STANES & Co.,

A. E. RAMSAY.

## Appendix II.

## CORRESPONDENCE WITH REFERENCE TO COCHIN AS A HARBOUR.

Dated 4th April 1879.

From—J. H. ASPINWALL, Esq., Chairman, Chamber of Commerce, Cochin,  
To—LIEUT.-COLONEL C. S. THOMASON, R.E., on Special Duty, Calcutta.

REFERRING to the interview which a deputation of the members of this Chamber had with you in November last, I have now the honor to address you on the subject of the improvement of Cochin Harbour, and to request that you will be pleased to submit this communication to Government for its favorable consideration.

2. This Chamber has heard with pleasure that professional opinion is unanimous on the point that Cochin could be converted into a first-class harbour, at a reasonable cost; but, from your observations at the interview referred to, I gather that, as it is essential before any project is sanctioned it should be demonstrated by reliable data that the work would be reproductive to the extent of at least 4 per cent.\* on the proposed outlay, I beg to forward herewith statistics of shipping, tonnage and imports and exports for the years 1876-77 and 1877-78, which have been carefully compiled from official records, and are perfectly trustworthy. It will be observed that the trade of Narakal has been included in these statements, as vessels frequent that port, not because it has any traffic of its own, but on account of its safe anchorage during the south-west monsoon, when Cochin is inaccessible. The whole of the business done there is on account of the mercantile community of this port, so that, virtually, it is part and parcel of the trade of British Cochin, which would not be temporarily diverted to that place if facilities for landing and shipping during the monsoon existed here.

3. Although these statistics speak for themselves, this Chamber would urge upon your special attention the fact that, allowing the figures relating to Narakal to stand separately, the proportions of the import and export trade of Cochin alone are of sufficient magnitude to justify this Chamber's holding out the prospect of the merchants being well able to contribute the whole of the interest on the estimated amount required for the harbour.

4. The imports during the last two seasons have been as follows:—

|                  |     | Cochin. | Narakal. |
|------------------|-----|---------|----------|
|                  |     | Tons.   | Tons.    |
| 1876-77          | ... | 73,817  | 14,648   |
| 1877-78          | ... | 56,165  | 27,424   |
| Total            | ... | 129,982 | 47,072   |
| and the exports— |     |         |          |
| 1876-77          | ... | 61,147  | 3,456    |
| 1877-78          | ... | 45,629  | 1,518    |
| Total            | ... | 106,776 | 4,974    |
| aggregating—     |     |         |          |
| 1876-77          | ... | 134,964 | 23,104   |
| 1877-78          | ... | 101,794 | 28,942   |

As almost all articles of export go free of duty, and it is also probable that import duties will be either abolished or considerably reduced, this Chamber is decidedly of opinion that both importers and exporters would cheerfully consent to pay a tax of Rs. 1½ per ton, by way of wharfage or bunder fees, in view of the numerous advantages which they would enjoy by the construction of the harbour, chief among which would be the saving in lighterage alone, and the ease and facility and the immunity from damage with which goods could be landed and shipped at all times of the year. This alone would give a revenue of more than 4 per cent. on the proposed outlay of a million; but if an additional guarantee and a source of income were required, the port-dues could be raised at the rate of one anna per ton; an impost which would certainly not be appreciably felt by the shipping, considering how greatly it would benefit by a harbour which would afford it shelter and numerous conveniences when other ports on the coast are unapproachable. The Chamber has given this matter mature and careful consideration, and, so far as the mercantile community is concerned, it has no hesitation in asserting that the proposed charge of Rs. 1½ per ton will in no way cripple or strangle the trade of the port; and it therefore respectfully begs that due weight will be given to this suggestion by the Government in considering the claims of this port to improvement.

5. From your personal inspection of this harbour, you are no doubt satisfied that its capabilities are such that it could without difficulty accommodate 25 large ships; but should any portion of the river or back water belonging to the neighbouring State of Native Cochin be required, this Chamber has the assurance of those in authority in that State, that no obstruction or difficulty need be anticipated, as the Government of His Highness the Rajah of Cochin will be prepared to make any reasonable concessions which may be required by our Government.

6. Another matter which the Chamber would bring to your notice is the existence in abundance of material for works of the proposed kind at Kakanad—a place in Native Cochin in close proximity to this port. The groynes which were thrown out on this, as well as the Vypeen shore, some years ago, when the encroachments of the sea threatened the town, are composed of granite brought from this place. Large quantities of material of this description are available, and could be conveyed by the backwater at comparatively cheap rates.

7. The Chamber would further beg to observe that during the late famine an immense trade was carried on between the rice ports and Cochin; and almost all the towns on the line of railway and in Travancore to the south received a large share of their supplies from this port. Narakal proved a valuable auxiliary to Cochin, as during the south-west monsoon numerous cargoes were landed there and conveyed to the famine-stricken districts. Vessels which were unable to approach any other port on the coast found shelter at Narakal and discharged their cargoes. Had landing and shipping facilities been available at Cochin during the rainy season, all those vessels which resorted to Narakal would have come into this harbour, and landed their goods more expeditiously and cheaply.

8. The Chamber would take this opportunity of stating that the subject of extending the railway to Cochin is now engaging the serious attention of the Cochin Sirkar and the mercantile community, and arrangements are already in progress to bring the project forward in a definite and tangible shape. The proposed line will run through a thickly populated country, as may be seen from the subjoined comparative statement of the density of population in the report of the census of Native Cochin taken in 1876:—

|                         |     |     |     | Density per square mile. |
|-------------------------|-----|-----|-----|--------------------------|
| Oude                    | ... | ... | ... | 463.06                   |
| Belgium                 | ... | ... | ... | 451.50                   |
| Cochin                  | ... | ... | ... | 441.51                   |
| England and Wales       | ... | ... | ... | 389.30                   |
| North-Western Provinces | ... | ... | ... | 378.31                   |
| Bengal                  | ... | ... | ... | 269.30                   |
| Madras                  | ... | ... | ... | 227.19                   |
| British India           | ... | ... | ... | 200.70                   |
| Germany                 | ... | ... | ... | 193.36                   |
| France                  | ... | ... | ... | 178.82                   |
| Punjab                  | ... | ... | ... | 172.51                   |
| Bombay                  | ... | ... | ... | 133.40                   |

Taking the above fact in connection with the well-known fertility of the country, and the importance of the port of Cochin as the natural outlet for the produce of the neighbouring Native States, an enormous goods and passenger traffic may safely be calculated upon. It would be superfluous to dilate upon the numerous advantages which the railway to Cochin would secure to the country; but the Chamber would only remark that a railway, in times of famine, is simply invaluable. The Secretary of State for India, in his despatch of the 10th January 1878, appointing the Famine Commission, writing on this subject, observes: "The value of railways as an assurance to the population against the worst sufferings of famine, has been singularly illustrated during the past year. Without their aid, it would have been wholly impossible to convey sufficient grain to the inland districts. Their resources, however, were strained to the utmost, and at one time a serious apprehension was entertained that they would be overtasked. How far it will be possible, with a due regard for financial considerations, to bring a wider range of country within their immediate reach is a question which will doubtless occupy your earnest attention at an early period." Considering the magnitude of the rice trade of this port particularly during the prevalence of the famine, and the difficulty experienced in conveying supplies in large boats to Tiroor, the nearest railway station, cheaply and expeditiously, owing to the want of water in the canals, a line from Cochin to Shoranoor would be an excellent feeder in similar emergencies, especially when time and expenditure are two important considerations. The Chamber need not dwell further on this subject, as it will in due course go before the Government in a matured and definite form.

9. The Chamber would take this opportunity of thanking you for the ready and courteous attention with which you have received its representations; and in concluding, it hopes that the claims of Cochin Harbour to improvement will meet with the consideration they deserve at the hands of Government.

Statement showing number of vessels and their tonnage and port-dues collected at Cochin and Narakal during the following seasons.

| Seasons. | Description of vessels. | Number. |          | Tonnage. |          | Port-dues collected. |    |    |          |    |    |
|----------|-------------------------|---------|----------|----------|----------|----------------------|----|----|----------|----|----|
|          |                         | Cochin. | Narakal. | Cochin.  | Narakal. | Cochin.              |    |    | Narakal. |    |    |
|          |                         |         |          |          |          | Rs.                  | A. | P. | Rs.      | A. | P. |
| 1876-77  | Steamers ...            | 98      | 36       | 102121   | 35,237   | 17,878               | 0  | 6  |          |    |    |
|          | Ships ...               | 139     | 31       | 45,563   | 18,439   | 5,647                | 14 | 0  |          |    |    |
|          | Native craft ...        | 995     | 2        | 42,846   | 26       | 4,059                | 1  | 0  |          |    |    |
|          | Total ...               | 1,230   | 69       | 190530   | 53,702   | 27,584               | 15 | 6  | 5,396    | 10 | 0  |
| 1877-78  | Steamers ...            | 110     | 36       | 115100   | 46,076   | 18,161               | 13 | 6  |          |    |    |
|          | Ships ...               | 122     | 24       | 43,363   | 11,549   | 6,488                | 10 | 3  |          |    |    |
|          | Native craft ...        | 1,260   | 1        | 50,463   | 13       | 3,263                | 9  | 0  |          |    |    |
|          | Total ...               | 1,492   | 61       | 208926   | 57,638   | 27,914               | 0  | 9  |          |    |    |

Statement of imports and exports—Cochin and Narakal.

| Seasons. | Ports.  |     | Total Imports. | Total Exports. | Imports of rice and paddy only. |
|----------|---------|-----|----------------|----------------|---------------------------------|
| 1876-77  | Cochin  | ... | Tons.          | Tons.          | Tons.                           |
|          | Narakal | ... | 73,817         | 61,147         | 48,262                          |
|          |         |     | 19,643         | 3,456          | 14,980                          |
|          |         |     | 93,465         | 64,603         | 63,242                          |
| 1877-78  | Cochin  | ... | 56,165         | 45,629         | 49,211                          |
|          | Narakal | ... | 27,424         | 1,518          | 19,516                          |
|          |         |     | 83,589         | 47,147         | 68,727                          |

Dated 18th December 1878.

From—J. R. OUGHTERSON, Esq., Cochin,

To—LIEUT.-COLONEL C. S. THOMASON, R.E., on Special Duty.

I did not intend writing you about the prospects of this harbour; but it seems unlikely we shall get the Chamber of Commerce together this year, and some matters should be brought to your notice now, in case you may have to give an opinion regarding various ports on this coast. Believe me, there is a great deal of interest felt in the subject by the true dwellers in Cochin. We, Europeans, are birds of passage—perhaps more so in Cochin than elsewhere; but the born and bred inhabitants know pretty well what will benefit them, and the improvement of the harbour is a constant topic of conversation.

Rightly or wrongly, most men here, nautical and land, believe that the first thing to be done is to run out groynes. They laugh at the idea of dredging doing any good till the scour is increased. They for the most part hold that the Cruz Millagree gap was caused by the unprotected state of the western coast of the backwater allowing filtration to such an extent that the seabed was actually washed out to sea, and not by the picking action of the sea itself; and there seems to be some sense in the theory. It should be examined.

**Exports.**—1876-77 seems a fair year to take as an average, and the chief goods exported amounted to 26,569 tons.

**Imports.**—I enclose a memorandum of those of rice and paddy alone, 1870—78. The lowest appears to be 1874-75, giving 30,000 tons altogether. We have 46,000 tons in 1877-78.

We have, besides, minor goods exported and imported, the full details of which I have not been able to obtain.

The bulk of the above are either the produce of or for consumption in the Native States of Cochin and Travancore, and any port-dues levied would ultimately be paid by the producer or consumer—in fact, we (the British) would take the interest of the cost of making our harbour out of their pockets; and they can stand a good pull, for the price of their produce has risen vastly during the last few years. To make this plain, we will presume the European merchant orders his Cochin correspondent to send him Native coffee to sell or lay down at 65 per cwt. Let us take 7s. 6d. as representing the present charges, including preparing, packing, shipping, commission, freight, insurance, leaving 57s. 6d. as the cost of the rough article, which the Cochin merchant can pay to the Native producer. The harbour improvements necessitate

1½d. per cwt. being added to the cost of shipping (in the shape of a bunder fee), so the producer gets only 57s. 4½d. per cwt.; for the merchant cannot pay more in the lump than his London correspondent authorized, viz., 65.

The importer of rice will, on the other hand, demand 1½d. more per cwt. from the consumer in the Native State, nor is there any danger that even 2d. per cwt. would drive trade to Alleppey, Quilon, or Narakal, the Native ports, because even now Cochin is a better port to ship and land produce and grain at than any of these by Rs. 2 per ton.

I have not time to go into the full arguments. I can only suggest points; but in my humble opinion it would not be necessary to execute many works besides the groynes. Under a judiciously-chosen port trust, the place would soon make itself, if large ships could enter the port at all seasons. One thing may be taken for granted, that Beypore will never become an outlet for Cochin and Travancore produce; and any money spent with such a view will be wasted. Cochin is the natural harbour for the whole of the system of rivers that fall into the Cochin and Travancore backwaters; and as the Natives of these States will have to pay in the long run for the improvements, it seems curious that the British should hesitate to make improvements which, while of advantage to the Native States, will extend the facilities for the employment of British shipping, and in a hundred ways promote the industry of its own port and people.

I regret that I have not time to go more fully into the subject. I have made one or two attempts to elaborate it, but have always been prevented by press of work.

Statement showing imports of rice and paddy into Cochin during the following years.—

| RICE.     |              |         |  | PADDY.    |              |         |  |
|-----------|--------------|---------|--|-----------|--------------|---------|--|
| Year.     |              | Cwt.    |  | Year.     |              | Cwts.   |  |
| July 1870 | to June 1871 | 479,603 |  | July 1870 | to June 1871 | 219,123 |  |
| " 1871    | " 1872       | 767,383 |  | " 1871    | " 1872       | 230,373 |  |
| " 1872    | " 1873       | 542,665 |  | " 1872    | " 1873       | 223,632 |  |
| " 1873    | " 1874       | 278,001 |  | " 1873    | " 1874       | 229,822 |  |
| " 1874    | " 1875       | 247,810 |  | " 1874    | " 1875       | 337,410 |  |
| " 1875    | " 1876       | 443,473 |  | " 1875    | " 1876       | 469,095 |  |
| " 1876    | " 1877       | 831,025 |  | " 1876    | " 1877       | 559,126 |  |
| " 1877    | " 1878       | 547,282 |  | " 1877    | " 1878       | 369,789 |  |

Statement showing the number and tonnage of vessels that frequented the Port of Cochin and the amount of port-dues collected thereon.

| OFFICIAL YEAR.                          | Number and tonnage of vessels. |          | Amount of port-dues collected. |    |    |
|-----------------------------------------|--------------------------------|----------|--------------------------------|----|----|
|                                         | Number.                        | Tonnage. |                                |    |    |
| (April to March), official year 1858-59 | 1,707                          | 75,748   | 2,357                          | 1  | 9  |
| Ditto ditto 1859-60                     | 1,619                          | 87,969   | 2,937                          | 6  | 10 |
| Ditto ditto 1860-61                     | 1,819                          | 94,407   | 4,952                          | 15 | 3  |
| Ditto ditto 1861-62                     | 1,884                          | 102,989  | 7,229                          | 0  | 0  |
| Ditto ditto 1862-63                     | 1,718                          | 99,331   | 7,326                          | 11 | 9  |
| Ditto ditto 1863-64                     | 1,848                          | 121,916  | 9,552                          | 8  | 3  |
| Ditto ditto 1864-65                     | 1,588                          | 131,404  | 9,806                          | 0  | 0  |
| Ditto ditto 1865-66                     | 1,432                          | 121,723  | 8,798                          | 5  | 3  |
| Ditto ditto 1866-67                     | 1,259                          | 99,400   | 1,821                          | 15 | 9  |
| Ditto ditto 1867-68                     | 1,642                          | 91,869   | 7,205                          | 15 | 0  |
| Ditto ditto 1868-69                     | 1,780                          | 125,212  | 14,212                         | 3  | 3  |
| Ditto ditto 1869-70                     | 1,342                          | 136,763  | 14,341                         | 8  | 3  |
| Ditto ditto 1870-71                     | 1,466                          | 131,482  | 13,606                         | 9  | 3  |
| Ditto ditto 1871-72                     | 1,621                          | 143,079  | 14,815                         | 8  | 0  |
| Ditto ditto 1872-73                     | 1,430                          | 162,901  | 19,650                         | 0  | 3  |
| Ditto ditto 1873-74                     | 1,511                          | 123,938  | 14,221                         | 3  | 9  |
| Ditto ditto 1874-75                     | 1,842                          | 161,747  | 19,739                         | 1  | 0  |
| Ditto ditto 1875-76                     | 1,639                          | 192,693  | 24,123                         | 3  | 0  |
| Ditto ditto 1876-77                     | 1,598                          | 204,796  | 27,811                         | 9  | 0  |
| Ditto ditto 1877-78                     | 1,500                          | 209,199  | 28,276                         | 13 | 3  |

J. R. OUGHTERSON.

No. 18 M.

GOVERNMENT OF INDIA.

PUBLIC WORKS DEPARTMENT.

All communications  
should be addressed  
to the Secretary.

Civil Works  
Miscellaneous.

To the Secy. to the Govt. of Madras,  
P. W. Deptt.

Fort William 25<sup>th</sup> January 1881.

Sir,

With reference to correspondence ending with your telegram of the 15<sup>th</sup> instant, I am directed to forward a copy of Sir A. Clarke's Minute on Indian Harbours, dated 1<sup>st</sup> July 1879, but I am to invite your attention to the letter from this office, No. 325 M dated 27<sup>th</sup> August 1879 in regard to the general question.

2.

I am to add that no  
copies

1  
No. 534 / 57

copies of Coll. Thomason's Reports  
on Harbours were received  
in this Office, and to refer you  
to P. W. Deptt letter No 314 M dated  
7<sup>th</sup> August 1879, forwarding copies  
of Sir A. Clarke's Minute on the  
Madras Harbour. -

I have the honor to be,  
Sir,

Your most Obedt Servt

W. P. Jenkins

Capt R. E.

Asst Secy to the Govt of India

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